



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/917,500 | 07/27/2001 | Daniel A. Kearl | 10011322-1 | 9800 |

7590 10/27/2003
HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P. O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

BELL, BRUCE F

ART UNIT PAPER NUMBER

1746

DATE MAILED: 10/27/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/917,500

Applicant(s)

KEARL, DANIEL A.

Examiner

Bruce F. Bell

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) 35-49, 55 and 57 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 24-34 and 50-54 is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-12, 56 and 58 is/are rejected.
- 7) ☒ Claim(s) 6, 7 and 13-23 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☒ Interview Summary (PTO-413) Paper No(s). 6.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5. 6) ☐ Other:

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-34, 50-54, 56, 58, drawn to a bipolar plate, fuel cell stack and end plate, classified in class 429, subclass 32.
 - II. Claims 35-49, drawn to a method of making a bipolar plate, classified in class 427, subclass 115.
 - III. Claim 55, drawn to a method of making an end plate, classified in class 29, subclass 825+.
 - IV. Claim 57, drawn to a method of making a fuel cell stack, classified in class 29, subclass 623.1+.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as a bipolar plate, fuel cell stack and end plate, and a method of making a bipolar plate. The search for the method of making is not required for the apparatus as instantly and further, the bipolar plate, fuel cell stack and end plate can be made by a materially different process such as by electro-erosion of the semiconductor plate to form the channels.

Invention I and III are related as the bipolar plate, fuel cell stack and end plate, and a method of making an end plate. The bipolar plate, fuel cell stack and end plate can be made by a materially different process such as by electro-erosion of the semiconductor plate.

Invention I and IV are related as the bipolar plate, fuel cell stack and end plate, and a method of making a fuel cell stack. The fuel cell stack of invention I does not

Art Unit: 1746

require that the fuel cell stack be completed with end plates and therefore the group I invention is made by in a materially different way.

Inventions II and III are related as a method making a bipolar plate and a method making an end plate. The method of the bipolar plate requires etching of both surfaces and the end plate requires only once surface to be etched. Since the two apparatus are different parts, they would require different searches.

Inventions II and IV are related as a method of making a bipolar plate and a method of making a fuel cell stack. The search for the bipolar plate does not require the same search as would the method of forming the fuel cell stack since the fuel cell stack requires assembling of the anode, cathode, electrolyte, water transport plates, etc. which the search for the bipolar plates does not require.

Inventions III and IV are related as a method of making an end plate and a method of making a fuel cell stack. The search for the end plate does not require the same search as would the method of forming the fuel cell stack since the fuel cell stack requires assembling of the anode, cathode, electrolyte and water transport plates, etc. which the search for the end plates does not require.

2. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

3. During a telephone conversation with Mr. Timothy Myers on 08-07-2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-34, 50-54, 56, 58. Affirmation of this election must be made by applicant in

Art Unit: 1746

replying to this Office action. Claims 35-39, 55 and 57 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

DETAILED ACTION

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, 8-10, 56 and 58 are rejected under 35 U.S.C. 102(b) as being anticipated by Bossel (5034288).

Bossel discloses a fuel cell arrangement which includes a bipolar plate having channels 7, 8 for air and for gaseous fuel (CH_4), wherein the plate has ribs 11 on both sides of the plate. See Figures 1 and 4. The bipolar plate is shown to be constructed of a material that is a thickness of 5 mm (5,000 microns). See example 1. Further, the patent teaches that the ribs of 0.5 mm thick sheet has a center to center distance of 6mm, a width of 2.5 mm at the base and a width of 1.5 mm at the top. The patent shows that the bipolar plate is made of the semiconductor material Silicon Carbide (SiC). See example 4 and 6.

The prior art of Bossel anticipates the applicants' instant invention as set forth above, with respect to the teaching of a semiconductor bipolar plate with a flow

Art Unit: 1746

channel passages to confine the fuel and oxidizing fluids as set forth in the instant claims.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bossel in combination with Patel et al (4567117)

Bossel is as set forth above in the 35 USC 102 rejection.

Bossel does not disclose the use of a reforming catalyst in the flow paths of the bipolar plate to generate hydrogen.

Patel et al disclose a bipolar plate that utilizes a reforming catalyst in the flow passages of the bipolar plate, wherein the catalyst is one of nickel. See col. 5, lines 2-10 and 27-35.

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made because even though the prior art of Bossel does not disclose the use of a reforming catalyst in the passageways of the bipolar plate, the prior art of Patel et al shows that it is within the ability of the skilled artisan to do so for the purpose of generating hydrogen going to the fuel cell and to also promote uniform temperature distribution in the

Art Unit: 1746

cell. Therefore, the prior art of Bossel in combination with Patel, renders the applicants' instant invention obvious for the reasons set forth above.

Allowable Subject Matter

8. Claims 6, 7, 13-34, 50-54 are allowable over the prior art of record.
9. The following is a statement of reasons for the indication of allowable subject matter:


The prior art of record fails to teach and/or suggest a bipolar plate comprising a conduit there through for cooling or heating. The prior art also fails to teach and/or suggest the use of resistive elements and sensors located in the bipolar plate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bruce F. Bell whose telephone number is 703-308-2527. The examiner can normally be reached on Monday-Friday 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 703-308-4333. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

BFB
October 20, 2003


Bruce F. Bell
Primary Examiner
Art Unit 1746